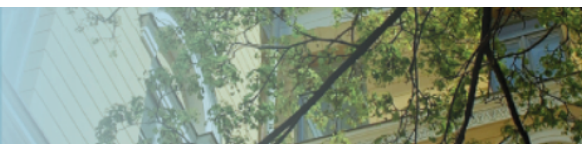


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## **« Some Vanity of Mine Art » : Spectacular Science in *The Tempest***

Around 1620 a crowd of transfixed Londoners attended what was probably a world's scientific *première* as Cornelis Drebbel (1572-1633), a Dutch scientist who had entered James's service in 1605, publicly demonstrated that submarine navigation was no longer a mere scientific fantasy. The crowd saw his prototype submarine disappear into the Thames not far from Westminster and they believed that Drebbel and his crew had drowned when they resurfaced near Greenwich some three hours later<sup>1</sup>.

For the most part, this scientific achievement took place under water and was therefore largely invisible to the public eye, but it may nonetheless be described as a true « spectacle » for it shares many characteristics with an actual theatrical performance. The Thames served as a stage on which – or rather under which - Drebbel and his crew performed their scientific *tour de force* while the King and the Londoners watched in awe and expectation. Drebbel's experiment serves as a magnificent example of « the ostentatious science » which is sometimes believed to have found a more congenial environment on the Continent than in Tudor or Stuart England<sup>2</sup>. Drebbel, however, was certainly one of the scientists who helped to bring James's court closer to Rudolf's in Prague, together with other men of science like John Dee whose « *flying scarabeus* », (which he built for a production of Aristophanes's *Pax* at Trinity College, Cambridge), earned him a long-lasting reputation as a magician<sup>3</sup>. Like Drebbel or Dee, most Renaissance « scientists » were intent on producing spectacular shows calculated to impress their audience. It is true

that in Bacon's *New Atlantis*, the Brothers of the House of Salomon mainly aim at improving the human condition through « the effecting of all things possible ». But their scientific achievements often take the form of magnificent spectacles on which one can feast one's eyes or one's senses :

But above all, we have heats in imitation of the sun's and heavenly bodies heats ... whereby we produce admirable effects... We have also sound-houses, where we practise and demonstrate all sounds and their generation... Divers instruments of music likewise to you unknown, some sweeter than any you have ; together with bells and rings that are dainty and sweet<sup>4</sup>.

I would like to suggest that these lines offer an insight into the kind of science that Prospero engages in. Just like Drebbel or Bacon's fictional scientists, Prospero too produces « admirable effects ». As a magician and a scientist, he relies on his « art » to create spectacular illusions which enable him to take control over his enemies : the opening storm is a case in point, just like the banquet scene in act III. Spectacle, especially in its musical or dramatic form, is the means by which Prospero manipulates his enemies, and it is fair to say that his « science » serves to illustrate the power of scientific illusion.

Yet scientific illusion is a sword that cuts both ways. If Prospero's « art » is based on the union of science and spectacle, it is also part of the « insubstantial pageant »

which, in his famous « revels speech », Prospero says shall dissolve leaving « not a rack behind » (IV, 1, 146-158). In this paper I will suggest that by foregrounding the spectacular quality of Prospero's science, Shakespeare offers a very ambivalent image of science, at once powerful and immaterial. It will be argued that his art is a far cry from Bacon's solid science whose primary aim is to produce permanent effects for the benefit of mankind.

## I

In I, 2, Prospero tells his daughter Miranda that he learnt his art while he still was the rightful Duke of Milan. A devoted adept of the « liberal arts », Prospero lost all interest in the more practical affairs of his dukedom so that his passion for knowledge was the very cause of his exile :

And Prospero the prime duke, being so reputed  
In dignity, and for the liberal arts  
Without a parallel ; those being all my study,  
The government I cast upon my brother  
And to my state grew stranger, being transported  
And rapt in secret studies (I, 2, 72-77).

As is well-known, the phrase « liberal arts » refers to the subjects of the *trivium* – grammar, logic, rhetoric – and the *quadrivium* – arithmetic, geometry, music and astronomy. Prospero is very reminiscent of those Renaissance princes like Rudolf II

who devoted a substantial part of their wealth, time and power to the quest of the philosophical stone. In Prospero, Miranda and the audience simultaneously discover both a duke and a man of science, but one is tempted to add that at this point in the play, Prospero is considerably closer to a solitary man of science than to a monarch surrounded by his court.

Science is not just the reason why Prospero was deposed : it is also the means by which he intends to recover his crown. His power over the elements is to help him to regain the political influence he once enjoyed in Milan. Limited as his *political* power may now be, Prospero's *scientific* power is unparalleled among men. He even claims to have stolen Jupiter's fire (V, 1, 44-6). Caliban also remarks that there is no point in resisting his power for it is so divine-like that even Sycorax's god Setebos could not defeat him (I, 2, 373-5). Prospero's absolute domination of his spirits may be read as a metaphor of his complete mastery over nature. By controlling the four natural elements through the agency of his two servants, the Shakespearean magus may rule over the whole physical world, from the « ooze of the salt deep » to the starry sky.

Prospero's full control over his natural environment echoes the ambitions of Renaissance natural philosophers like Dee or Bacon who were convinced that the scientist's powers were unlimited<sup>5</sup>. But his art also reflects Renaissance science in its predilection for spectacular events. Just like Drebbel's, Prospero's ostentatious science bears an evident resemblance to Renaissance lavish scientific shows, as can be seen from the masque in act IV. By describing it as « some vanity of mine art », Prospero draws our attention to the fact that science and art were part of the same intellectual continuum at the time. Indeed Prospero's science is never confined to the solitary,

musty chamber of some old lunatic, as in Swift's *Gulliver's Travels*, where the narrator visits a series of cells inhabited by various men of science<sup>6</sup>. On the contrary, Shakespeare's « scientist » brings his « art » out into the open for everybody to see. « Scientists », of course, did not exist in the Renaissance, if we take the word in its modern sense. As Stephen Shapin has shown, the « scientist » was certainly not a natural feature of the cultural environment of the time. But some scholars did display a genuine interest in what we would now call scientific subjects – such as mathematics or astronomy – and they may therefore be described as « scientists », or « men of science », for lack of a better word. My point is that « scientists » then were often interested and highly competent in more than one subject : Thomas Harriot was an excellent mathematician, a competent linguist and a rigorous ethnographer, for instance. Besides, Renaissance men of science always combined a strong interest in « the mathematical arts » with an impressive knowledge of the classical tradition. In other words they were men of science *and* humanists at the same time. It would be a complete mistake to draw a clear-cut distinction between art and science, mathematics and the theatre, as the example of Dee's « flying scarabeus » suggests. Prospero conforms to this tradition. Although « art » and « science » were virtually interchangeable at the time, Prospero's use of the word « art » seems all the more appropriate for a modern audience as it brings into focus the true nature of his science.

Most of his scientific accomplishments may indeed be described as shows or spectacles of a sort, from the music that draws Ferdinand towards Miranda in I, 2, to the banquet which serves as a prelude to the moral conversion of Prospero's enemies in III, 3. Conversely, these various spectacles demonstrate his scientific dexterity, and may serve to illustrate the branch of science which Dee called « thaumaturgike » :

« that art mathematical which gives certain order to make strange workes, of the sense to be perceived and of men greatly to be wondered at ». It is perhaps no exaggeration to present the island as a very large stage where, instead of Drebbel's perpetual motion, one may see a perpetual spectacle<sup>7</sup>. Given the way science, music and theatrical performance are woven together in the play, it is no surprise that *The Tempest* should have proved so remarkably amenable to spectacular adaptations from the Restoration onwards. As is well-known, the play was adapted by Davenant and Dryden, and converted into a semi-opera in order to include as much music, machines and special effects as possible.

## II

The connection between science and spectacle has important consequences for the idea of science that Shakespeare delineates in his play. I should like to focus on the pantomime in III.3 because it clearly demonstrates how Prospero's science is predicated on the production of realistic illusions. « Several strange shapes » steal onto the stage, « bringing in a banquet » while a « marvellous sweet music » is being played. They then perform a brief pantomime in front of the bemused courtiers before suddenly vanishing into thin air. A disguised, harpy-like Ariel eventually joins the fray, causing the banquet to disappear « with a quaint device » which is very reminiscent of Dee's « flying scarabeus ». Acting as a revenger, Ariel then sharply rebukes Alonso, Sebastian and Antonio. The scene makes for a complex embedding of several shows, thus functioning as a play within the play within the play, with Prospero watching the courtiers watching the dancing spirits. Here, Prospero is both the director and the spectator of the show he has orchestrated. Watching the performance of his actors, he cannot refrain from passing comments on the show that

so engrosses his attention. Yet what matters even more than Prospero's reaction is the effect the pantomime produces on the villains. Alonso, Sebastian and Antonio are so impressed that their certainties begin to waver. They now are at the scientist's mercy : « My high charms work / And these, mine enemies, are all knit up / In their distractions. They now are in my power » (III, 3, 88-90). The show stirs the memory of their guilt : in the uproar that accompanies the vanishing of the banquet, Alonso hears the thunder « pronounce the name of Prosper » (III, 3, 88-90). Just like Drebbel's submarine, Prospero's science produces both spectacular and psychological effects ranging from amazement to fear. In actual fact, its very efficacy *depends on* Prospero's spectacle. By confusing his enemies, Prospero hopes to regain his former control over them. As Gonzalo aptly remarks, the show fulfils its role by instilling the venom of guilt into the villains' minds (III, 3, 105-7). Prospero's superhuman power thus takes the form of a series of spectacular illusions calculated to bring about a spiritual conversion. My point is not that Prospero's science serves as the metaphor of the playwright's « potent art », but rather that, in the Renaissance, science and theatre were not necessarily conceived of as radically different domains.

In *The Tempest*, spectacle is the « operative » dimension that Prospero's theoretical activity takes on. Should he be stripped of his scientific knowledge, Prospero could only stage pedestrian shows. Raising a tempest or putting on the masque are tasks which require the help of his « worthy spirits », i.e., his scientific knowledge. Conversely, without the island's spectacular shows, his science would remain what it was in Milan : a mere bookish and inefficient theoretical hobby.

### III

I have tried to show that science enables Prospero to create impressive sensory illusions which help him to manipulate his enemies. Yet Prospero's science may not be as successful as it seems to be. For one thing, it is unclear why Prospero chooses to abjure his « rough magic ». Why he should suddenly promise to « break his staff » and « drown his book » (V, 1, 54 and 57) remains a puzzling question in spite of much scholarly brain-racking. More importantly, perhaps, Antonio chooses to remain silent until the end of the play. He neither repents nor feels remorseful, so that, for all the miracles worked by Prospero throughout the play, the magus only gains half a victory at the end of act V. It is true that he has regained his dukedom, but as Antonio does not feel the slightest pang of conscience, Prospero has no choice but to substitute pardon for remorse. Yet in doing so, he breaks his own rule, forgetting that forgiveness was to be predicated upon repentance : « They being penitent, / The sole drift of my purpose doth extend not a frown further » (V, 1, 29-30). Antonio's remorselessness brings out the unalienable nature of his liberty of conscience which even as powerful a scientist as Prospero himself is unable to annihilate. Paradoxically enough, by keeping doggedly silent until the end of the play (except for one short line) Antonio acts as a spokesman for liberty while simultaneously embodying the limitations of Prospero's science. As it happens, Prospero is all too conscious of these limitations, as his famous speech about the vanity of life indicates (IV, 1, 146-158). Here, Prospero does not concern himself with evil only, he meditates about life and death. Shaking off his delusive dream of absolute power, Shakespeare's man of science seems to come to his senses again. He suddenly realizes that life is transient and that his art is vain. However, the seed of this idea was already present in his mind before he conjured up the masque, when he alluded to « the vanity of [his] art » (IV, 1, 39-41).



Here, of course, Prospero merely expressed his desire to present some pleasing, perfectly harmless illusion, and he did not give the phrase the same meaning as Cornelius Agrippa in his *De Vanitate Scientiarum et Artium*. Yet Prospero's phrase does certainly take on a new meaning when he suddenly interrupts the masque as his famous « revels speech » elaborates on a common Renaissance leitmotiv, namely the theme of man's intellectual limitations. The wonders of his science suddenly look insubstantial and transitory to him. This melancholy, disenchanted meditation on life and science should lead us to reconsider the spectacle of the opening storm. Like « this insubstantial pageant faded », the tempest is not real and it leaves « not a rack behind ». It was a splendid sensory illusion which involved not just the sense of sight but all five senses. Despite the violence of the storm, the sailors and courtiers all escaped unscathed, their clothes immaculate, and « fresher than before », as Ariel himself points out (I, 2, 218-9).

Admittedly, Prospero's « revels speech » does not deal specifically with science. Yet his melancholy meditation on the transience of life does not leave science untouched. Just like the theatre or life as a whole, of which it is a part, science too appears unreal and immaterial to him. His scientific miracles are like « the solemn temples » of religion and « the gorgeous palaces » of politics : they are built on sand and will eventually vanish into thin air. Prospero's victory is therefore limited in space and time, being both partial and temporary. Even if he managed to undo Antonio's treason through the agency of his science, there is nothing he can do about death. Returning to Milan, he reflects that « Every third thought shall be [his] grave » (V, 1, 311-2). The perpetual spring Ferdinand dreams about at the end of the masque does not belong to this world : « Let me live here ever! / So rare a wondered father and a wise / Makes

this place paradise » (IV, 1, 122-4). But the end of the play suggests that creating such a paradise is in fact far beyond Prospero's scientific reach. Prospero knows better than Ferdinand, or, for that matter, Miranda, who speaks some of the saddest lines in the play when she exclaims « O brave new world / That has such people in't » (V, 1, 183-4). The world she discovers is inhabited by crooks and traitors, and we may perhaps detect a touch of sadness in Prospero's concise answer: « 'tis new to thee ». Like the shepherds in Poussin's painting, *Et in Arcadia ego*, Prospero has come to realize that evil and death are part of his scientific Arcadia.

#### IV

Shakespeare's play eventually conveys a disenchanted vision of science, placing more stress on the limitations of art than on Prospero's scientific achievements. Yet, not all his contemporaries shared such a pessimistic vision of science. While arguing that producing spectacular illusions is one of the scientist's many talents, Bacon also insisted that science should by no means be confined within such narrow limits. With respect to the vision of science it sets forth, Bacon's *New Atlantis* certainly distances itself from *The Tempest*. True, Bacon too claims that the scientist should be able to produce wonderful spectacles and to create staggering illusions that deceive the senses : « We have also houses of the deceits of the senses ; where we represent all manner of feats of juggling, false apparitions, impostures and illusions; and their fallacies<sup>8</sup> ». But Bacon does not believe that science should *depend on* spectacle and he explicitly rejects ostentatious science in favour of a type of science that produces beneficial results. Besides, scientists should never try to pass illusion off as reality.

At the end of the play, Prospero has doffed his scientific coat. If he is ready to « chase

the ignorant fumes that mantle [his enemies'] clearer reason » (V, 1, 67-8), it is because he has abjured his « rough magic ». In *The Tempest*, science and illusion are so closely intertwined that they cannot be dissociated from each other. They come to an end simultaneously. Conversely, for Bacon, it is crucial to isolate science from illusion. Bacon's scientist should be able to imitate nature in everything she does, which includes optical and sensory illusions. But it does not follow that science as a whole should be conceived of as an illusion. Bacon's scientist is not beset by melancholy doubts like the ageing Prospero, nor does he ponder over the vanity of his art. He aims at producing « works » that will be beneficial to man by helping him to consolidate his domination over nature. For Bacon therefore, science is a far cry from Prospero's pageants, as Baconian science is supposed to pave the way for the happiness of humanity.

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<sup>1</sup> See Rosalie Colie, « Cornelis Drebel and Salomon de Caus: Two Jacobean Models for Salomon's House », *Huntington Library Quarterly* 18 (1954-5): 245-260. For a contemporary account of Drebbel's achievement, see Constantin Huygens, *Fragment d'une autobiographie*, 1631.

<sup>2</sup> See Frances Dawbarn and Stephen Pumfrey, « Science and Patronage in England, 1570-1625: a preliminary study », *History of Science* 42 (2004): 137-88.

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<sup>3</sup> On Dee, see for instance Peter J. French, *John Dee: The World of an Elizabethan Magus* (London: Routledge and Kegan Paul, 1972).

<sup>4</sup> Francis Bacon, *New Atlantis* in *Three Early Modern Utopias*, ed. Susan Bruce (Oxford, OUP, 1999), 181-2.

<sup>5</sup> For instance, Dee believed that mathematics could provide him with an insight into God's designs. See John Dee, *Mathematical Preface*, Londres, 1570, 3-4.

<sup>6</sup> See Jonathan Swift, *Gulliver's Travels*, Book III, chapter 5.

<sup>7</sup> Besides the submarine, Drebbel built other spectacular scientific instruments, including a « globe de verre, dans lequel il [fit] représenter le flux et le reflux de la mer, par un mouvement perpétuel réglé comme le flux naturel de la mer », according to the description given by the French scholar Pereisc. In *Epicoene or The Silent Woman*, Jonson has one of his characters deliver the following caustic lines : « My very house turns round with the tumult! I dwell in a windmill! The perpetual motion is here and not at Eltham » (V, 3).

<sup>8</sup> Bacon, *New Atlantis*, 183.